

# **CEN-TECH™**

## **FLEXIBLE INFRARED THERMOMETER**

**Model 94233**

### **ASSEMBLY AND OPERATING INSTRUCTIONS**



Visit our website at: <http://www.harborfreight.com>



**Read this material before using this product.  
Failure to do so can result in serious injury.  
SAVE THIS MANUAL.**

Copyright© 2006 by Harbor Freight Tools®. All rights reserved. No portion of this manual or any artwork contained herein may be reproduced in any shape or form without the express written consent of Harbor Freight Tools. Diagrams within this manual may not be drawn proportionally. Due to continuing improvements, actual product may differ slightly from the product described herein. Tools required for assembly and service may not be included.

**For technical questions or replacement parts, please call 1-800-444-3353.**

Revised Manual 10c

## Specifications

Features	Flexible 14-1/8" Shaft
Display	LCD w/White Backlight, Auto Data Hold Laser Guide
Polarity	Automatic (no indication for positive polarity): Minus (-) sign for negative polarity
Measurement Range	-58°F to 1112°F (-50°C to 600°C)
Resolution	(0.1° up to 200°, 1° over 200 °)
Power Supply	9V Battery (included)
Distance to Spot Ratio	8 to 1
Emissivity	Fixed @ .95



## Save This Manual

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.

## Safety Warnings and Precautions

**WARNING: When using tool, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.**

**Read all instructions before using this tool!**

1. **Keep work area clean.** Cluttered areas invite injuries.
2. **Observe work area conditions.** Do not use the Flexible Infrared Thermometer in damp or wet locations. Don't expose to rain. Keep work area well lighted. Do not use electrically powered tools in the presence of flammable gases or liquids.
3. **Keep children away.** Children must never be allowed in the work area. Do not let them handle the Flexible Infrared Thermometer.
4. **Store idle equipment.** When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep out of reach of children.
5. **Use the right tool for the job.** Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. There are certain applications for which this tool was designed. It will do the job better and more safely at the rate for which it was intended. Do not modify this tool and do not use this tool for a purpose for which it was not intended.
6. **Dress properly.** Protective, electrically nonconductive clothes and nonskid footwear are recommended when working. Wear restrictive hair covering to contain long hair.
7. **Use eye protection.** Always wear ANSI approved impact safety goggles.

8. **Maintain tools with care.** Keep the Flexible Infrared Thermometer clean for better and safer performance. The handle must be kept clean, dry, and free from oil and grease at all times.
9. **Disconnect power.** Turn off tool when not in use. Remove battery when not in use for a week.
10. **Stay alert.** Watch what you are doing, use common sense. Do not operate any tool when you are tired.
11. **Check for damaged parts.** Before using any tool, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for any broken parts or mounting fixtures; and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tool if any button does not turn On and Off properly.
12. **Guard against electric shock.** Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures..
13. **Do not operate tool if under the influence of alcohol or drugs.** Read warning labels if taking prescription medicine to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the tool.
14. **Maintenance.** For your safety, service and maintenance should be performed regularly by a qualified technician.
15. **Laser beams can cause permanent damage to eyes.** Never point the laser beam at another human or animal. **Caution:** Do not allow the beam to reflect on a surface; this could damage your eyes.
16. **Do not allow the laser light beam** to reflect on any gas; this could cause an explosion.
17. **CAUTION - The use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.**
18. **CAUTION - The use of optical instruments with this product will increase eye hazard.**
19. **This Flexible Infrared Thermometer** is not to be used for food service or medical applications.

**Note:** Performance of this tool may vary depending on tool battery power.

**Warning:** The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

## Unpacking

When unpacking, check to make sure the parts on page 8 are included. If any parts are missing or broken, please call Harbor Freight Tools at the number on the cover of this manual as soon as possible.

## Operation

### Preparing to Take Measurements

**Warning!** Laser radiation is dangerous and can cause permanent eye damage. Do not stare into the beam or point it at others.

**Note:** You will need to set the “C” or “F” key (5) to establish an LCD readout in either Fahrenheit or Celsius. Refer to the Assembly Drawing on page 8.

1. The Thermometer automatically powers ON when the Measuring Key (7) is selected. The Thermometer will power OFF automatically approximately 7 seconds after the Measuring Key (7) is released. **See Figure 2.**
2. Make sure the target is larger than the units’s spot size. The target should be at least twice as large. Being closer to the spot will assure accuracy.
3. Select the temperature units you wish by first pressing the Measuring Key (7) and then the “C” or F” Key (5). Toggle back and forth to choose the correct reading.

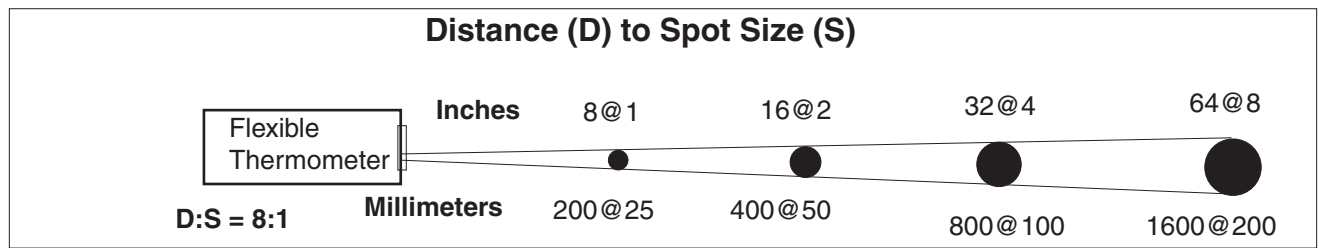


Figure 1

**Special Considerations:** Make sure the surface of the object is not covered with frost, dust or other materials. For accurate results, clean all surfaces before measuring. If the surface you are measuring is highly reflective, (while it is cool) either paint it with a heat-resistant flat black paint or put a non-reflective tape on the spot you are measuring.

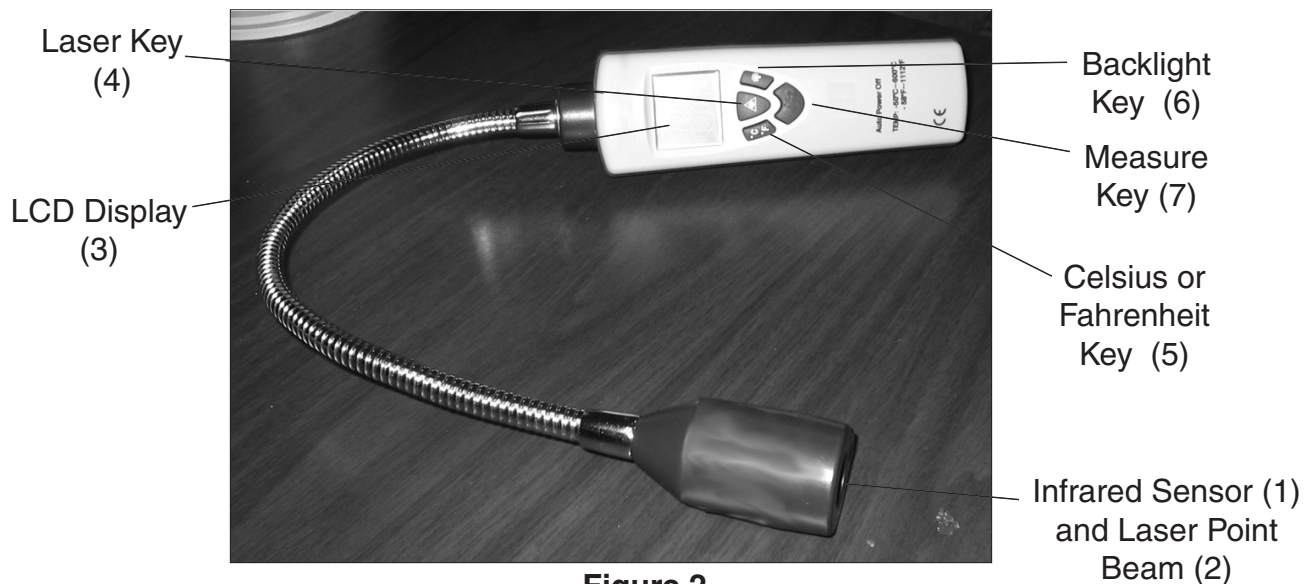
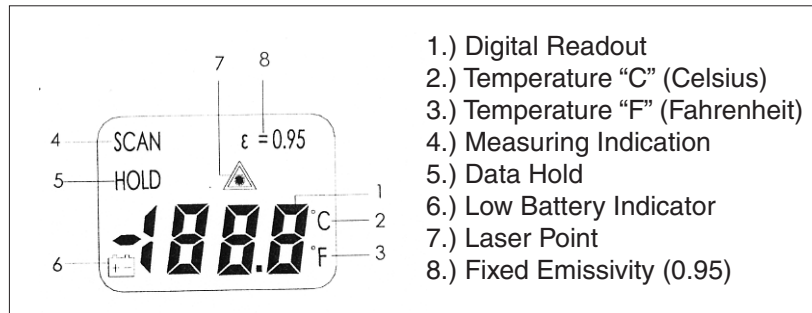


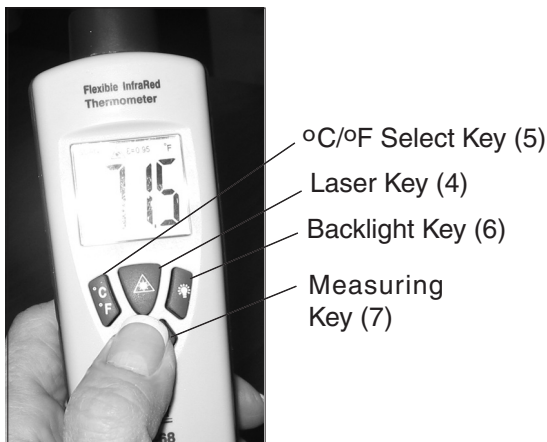
Figure 2

- The Thermometer will automatically hold the last temperature reading for seven seconds after pressing the Measuring Key (7) is pressed and released. No extra keys need to be pressed to freeze the display reading on the LCD. **See Figure 3.**
- To show the backlighting, first press the Measuring Key (7) and then press the Backlight Key (6). Press the Laser Key (4) while pressing the Measuring Key (7) to turn the Laser Pointer (2) **ON** which will activate the Infrared Sensor (1). Press the Laser Key again to turn the Infrared Sensor (1) **OFF**. **See Figure 5.**

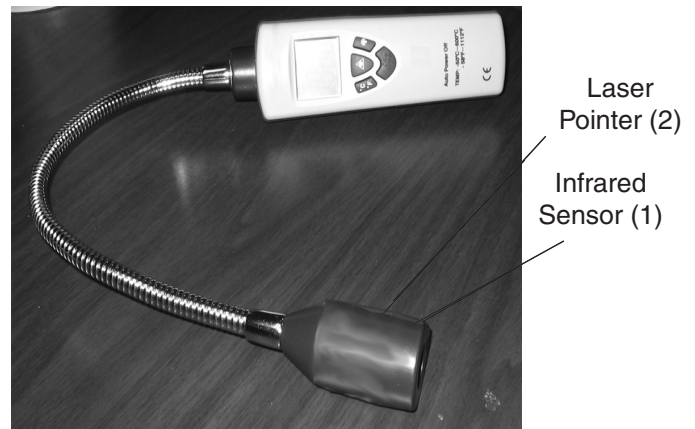
**You are now ready to measure.**



**Figure 3**



**Figure 4**



**Figure 5**

### **Measuring Operation**

- Hold the Thermometer in your hand, point the Laser Pointer (2) and Infrared Sensor (1) toward the object to be measured. The Thermometer will automatically compensate for temperature deviations from ambient temperature. **Note:** It will take up to 30 minutes to adjust to wide ambient temperature measurements, followed by high temperature measurements. Sometimes several minutes are required after the low or high temperature measurements are made; a cooling process must take place for the Infrared Sensor (1). **See Figure 5.**

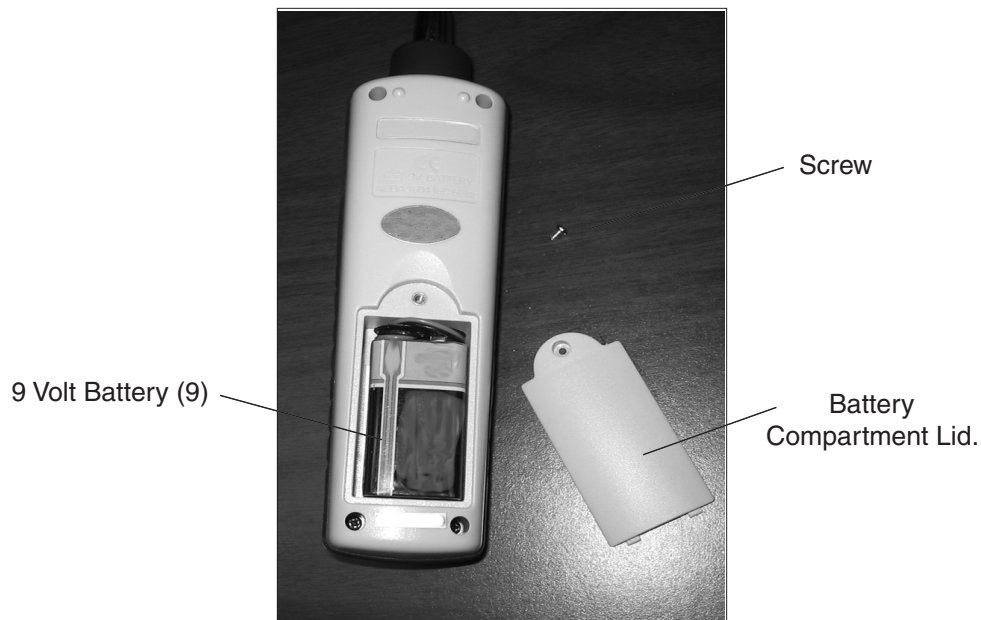
## Battery Replacement

**Note:** The LCD will indicate the battery is weak with a flashing display. *See Figure 6.*

1. Remove the Screw on the back of the unit to remove the battery compartment lid. (Screwdriver not provided).
2. Replace the battery, making sure the polarity connections on the battery correspond to the polarity in the battery compartment. Snap the battery in place. Reattach the lid back onto the unit. Tighten the Screw to secure. *See Figure 7.*
3. Replace the battery with only a new 9 Volt Battery. Check with your local Waste Disposal Facility, available in your community, for the proper disposal of used batteries.



**Figure 6**



**Figure 7**

## Recommendations and Reminders

1. This Thermometer is not recommended for use in measuring a shiny or polished metal surface such as stainless steel, aluminum, etc.) To compensate, cover the surface to be measured with masking tape or flat black paint. Allow the tape to reach the same temperature as the material underneath.
2. This unit cannot measure through transparent surfaces such as glass or clear plastic.
3. Steam, dust, smoke, etc. can prevent an accurate measurement.

## Emissivity

- Most organic materials and painted or oxidized surfaces have an emissivity of 0.95 (pre-set in the unit). Inaccurate readings will result from measuring a shiny or polished metal surface. See recommendations on page 6 for obtaining an accurate reading and refer to the chart below.

### ● Infrared thermometer specifications

Range (Automatic selection 0.1 ° up to 200°, 1° over 200°)	Resolution	Accuracy
-50.0 °C ~200.0 °C	-50.0°C~ -20.0°C 0.1 °C	± 5 °C ±2% of reading or ± 2 °C
200 °C ~600 °C	1 °C	±2% of reading or ± 2 °C
-58.0 °F ~200.0 °F	-58.0°F ~ -4.0°F 0.1 °F	± 10 °F ±2% of reading or ± 4 °F
200°F ~ 1112°F	1 °F	±2% of reading or ± 4 °F
<b>Note</b>	1. Accuracy is given at 18 °C to 28 °C (64 °F to 82 °F), less than 80 % RH 2. Accuracy specified is for emissivity of 0.95	
<b>Emissivity settings</b>	0.95 fixed	
<b>Distance Factor</b>	D : S= Approx. 8:1 (D=distance, S=spot)	

### Emissivity VALUES

Substance	Thermal emissivity	Substance	Thermal emissivity
Asphalt	0.90 to 0.98	Cloth (black)	0.98
Concrete	0.94	Human skin	0.98
Cement	0.96	Lather	0.75 to 0.80
Sand	0.90	Charcoal (powder)	0.96
Earth	0.92 to 0.96	Lacquer	0.80 to 0.95
Water	0.92 to 0.96	Lacquer (matt)	0.97
Ice	0.96 to 0.98	Rubber (black)	0.94
Snow	0.83	Plastic	0.85 to 0.95
Glass	0.90 to 0.95	Timber	0.90
Ceramic	0.90 to	Paper	0.70 to 0.94
Marble	0.94	Chromium oxides	0.81
Plaster	0.80 to 0.90	Copper oxides	0.78
Mortar	0.89 to 0.91	Iron oxides	0.78 to 0.82
Brick	0.93 to 0.96	Textiles	0.90

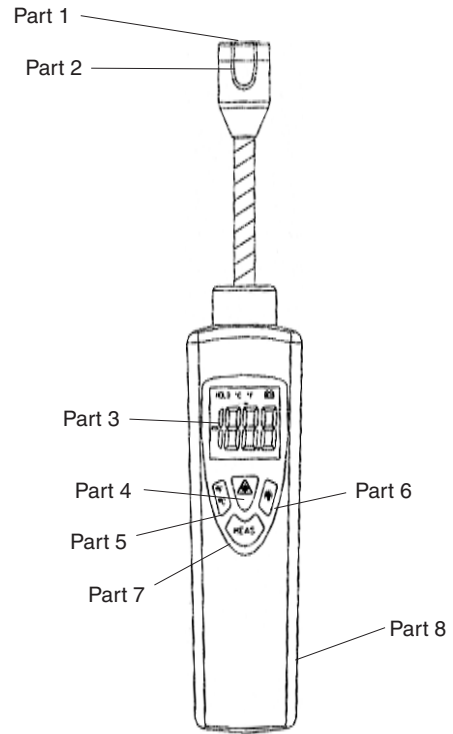
## Maintenance

- Keep the unit clean. Wipe it down with a lint free cloth.
- Make sure the laser is clear of any dirt or debris.
- Remove the battery if you are not using the unit for extended periods of time.

## Parts List

Part #	Description	QTY
1	Infrared Sensor	1
2	Laser Pointer Beam	1
3	LCD Display	1
4	Laser Key	1
5	Celsius or Fahrenheit Select Key	1
6	Backlight Select Key	1
7	Measuring Key	1
8	Battery Compartment	1
9	Carrying Case (no shown)	1

## Assembly Drawing



**Note: No replacement parts available for this unit.**

### PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER NOR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

**NOTE:** Some parts are listed and shown for illustration purposes only and are not available individually as replacement parts.



---

## LIMITED 90 DAY WARRANTY

---

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

**3491 Mission Oaks Blvd. • PO Box 6009 • Camarillo, CA 93011 • (800) 444-3353**